H1014
H4AR
12,5-3
3/3/10

East Waterway Geochron Core Field Summary
Dan Berlin
to:
Ravi Sanga, Brenda Bachman, craig.a.martin, pleon, joe.z.gailani, earl.hayter
03/03/2010 09:26 PM
Cc:
"Bruce Nairn", "D Williston", "Dave Schuchardt", "Debra Williston", "Doug Hotchkiss", "Jeff Stern", "Kathy Ketteridge", "Pete Rude", "Susan McGroddy", "Tom Wang", stephen.breithaupt, "Kirk Ziegler"
Hide Details
From: "Dan Berlin" <dberlin@anchorqea.com> Sort List...

To: Ravi Sanga/R10/USEPA/US@EPA, "Brenda Bachman" <brenda.m.bachman@usace.army.mil>, <craig.a.martin@usace.army.mil>, <pleon@parametrix.com>, <joe.z.gailani@usace.army.mil>, <earl.hayter@usace.army.mil>

Cc: "Bruce Nairn" <Bruce.Nairn@kingcounty.gov>, "D Williston" (b) (6), "Dave Schuchardt" <Dave.Schuchardt@Seattle.Gov>, "Debra Williston" <debra.williston@kingcounty.gov>, "Doug Hotchkiss" <hotchkiss.d@portseattle.org>, "Jeff Stern" <jeff.stern@kingcounty.gov>, "Kathy Ketteridge" <kketteridge@anchorqea.com>, "Pete Rude" <pete.rude@seattle.gov>, "Susan McGroddy" <susanm@windwardenv.com>, "Tom Wang" <twang@anchorqea.com>, <stephen.breithaupt@pnl.gov>, "Kirk Ziegler" <kziegler@anchorqea.com>

History: This message has been replied to and forwarded.

1 Attachment

STC Collection and Processing Memo_03Mar2010.pdf

Attached is the core collection and processing summary memo for the East Waterway geochron coring. It summarizes the field sampling for all cores attempted/collected and describes the approach for tiering sample analysis based on our expectations of which cores have the highest likelihood to provide the best dating information.

As the geochron data becomes available, we will summarize and provide the information to the sediment transport group for discussion. Please feel free to contact Tom Wang, Kathy Ketteridge, or me with any questions.
Thanks
Dan

Dan Berlin

ANCHOR QEA, LLC
dberlin@anchorqea.com
1423 Third Avenue, Suite 300
Seattle, WA 98101
T 206.287.9130
D 206.903.3322
F 206.287.9131
www.anchorqea.com

ANCHOR QEA

1423 Third Avenue, Suite 300
Seattle, Washington 98101
Phone 206.287.9130
Fax 206.287.9131
www.anchorqea.com

MEMORANDUM

To: Ravi Sanga, EPA **Date:** March 3, 2010

From: Tom Wang and Dan Berlin, Anchor QEA **Project:** 060003-01

Re: East Waterway Sediment Transport Characterization – Core Collection and Processing Summary

This memorandum summarizes the core collection and processing activities that occurred as part of the East Waterway Sediment Transport Characterization for the Supplemental Remedial Investigation/Feasibility Study (SRI/FS). Descriptions of sampling deviations, core collection and processing activities, and sampling scheme are provided below.

SUMMARY OF SAMPLING DEVIATIONS

All collection, processing, and sampling activities were performed in accordance with the Quality Assurance Project Plan (Anchor QEA 2009), with the exception of the deviations approved by EPA on January 22, 2010. These deviations will be summarized in the forthcoming Data Report and included the following:

- Change in processing technique from hydraulic extruder jack to longitudinal cutting in order to better preserve the sediment profile and increase sample interval accuracy.
- Clarification of the sampling scheme for archived samples such that archived samples would be analyzed for radiochemistry evaluation only (and not for total organic carbon or grain size).
- Clarification regarding compaction correction such that field sampling would be conducted using recovered depths (ex situ) and compaction corrections would be applied later during the data analysis stage.

SUMMARY OF CORE COLLECTION AND PROCESSING

Eighteen sediment cores were collected by divers using manually operated slide-hammer methodology in order to minimize disturbance to the sediment. Cores were collected from January 25 to February 1, 2010. Cores were processed, logged, and sampled from February 1 to February 3, 2010. The collected cores included GC-01, GC-02, GC-03, GC-05, GC-06, GC-07, GC-08, GC-09, GC-10, GC-11, GC-12, GC-13, GC-14, GC-15, GC-16, GC-18, GC-19,

and GC-20. An additional four cores were proposed (GC-04, GC-17, GC-21, and GC-22), but were unable to be collected due to difficulties penetrating into the substrate. Figure 1 depicts the location of each collected core, as well as the location of the four cores that were unable to be collected (shown in gray). Table 1 summarizes the recovered sediment length and sampled length for the 18 cores that were collected, as well as a summary of the number of attempts and observations made regarding the subsurface texture for each of the four cores that were unable to be collected. For each of the four cores not collected, the diver attempted multiple times to retrieve an acceptable core; however, dense substrate near the surface at each of these locations prevented penetration. The diver also searched in the vicinity of the target core location for suitable substrate to core, but was unable to find suitable coring locations in the vicinity of GC-04, GC-17, GC-21, and GC-22.

It should be noted that the absence of soft substrate in the vicinity of each of these four core locations suggests the absence of recent sediment deposition, making it unlikely that radioisotope analysis of sediment in these areas would provide any useful sediment accumulation rates. These cores were identified as low-priority cores based on the low likelihood that they would provide useful sediment accumulation rate information.

Table 1
Summary of East Waterway Sediment Characterization Cores

Station ID	Collection Attempts[2]	Core Collection Notes	Core Quality[1]	Length Processed (cm)	Bottom Sample Depth (cm)
GC-01	1	Successful collection, dense substrate prevented full penetration	good	86.5	86
GC-02	1	Short core, dense substrate prevented full penetration	good	44	42
GC-03	3	Short core, equipment malfunction prevented full penetration on first attempt; core tube broke on second attempt; third attempt yielded <1 foot of disturbed sediment. Restricted access from Coast Guard prevented recollection. The core from the first attempt was processed and sampled.	good	30	30
GC-04	1	Dense substrate prevented collection (e.g., sand substrate), no recent sediment deposition	not collected	0	0
GC-05	1	Successful collection	good	88	88

Station ID	Collection Attempts[2]	Core Collection Notes	Core Quality[1]	Length Processed (cm)	Bottom Sample Depth (cm)
GC-06	1	Successful collection, dense substrate prevented full penetration	good	76	76
GC-07	1	Successful collection	good	115	90
GC-08	2	First attempt core was stuck in sediment after retrieval coupling broke; core extracted during second attempt	fair	83	82
GC-09	1	Successful collection	good	105	90
GC-10	1	Successful collection	good	92	90
GC-11	1	Successful collection, dense substrate prevented full penetration (sand and wood)	good	77	76
GC-12	1	Successful collection	good	91	90
GC-13	1	Successful collection	good	107	90
GC-14	1	Successful collection	good	91	90
GC-15	1	Successful collection	good	99	90
GC-16	1	Successful collection	good	104	90
GC-17	1	Short core (<30 cm) due to dense substrate, but core lost when core barrel failed on extraction, diver observed vessel scour (sand substrate); no recent sediment deposition	not collected	0	0
GC-18	1	Successful collection	good	100	90
GC-19	2	Two cores were collected (A and B). Core A may have experienced pile driving due to presence of wood below 33 inches, but upper interval is likely intact. A second collection (Core B) was partially transported horizontally, which may have compromised the sediment structure. During processing it was noted that Core A was intact and did not show any signs of pile driving; Core B was slightly disturbed. Based on processing observations, Core A was submitted for sampling.	good (A), disturbed (B)	65 (A) 89 (B)	64 (A) 88 (B)
GC-20	3	Successful collection, during processing it was noted that the sidewalls were encased with broken shells in the top two units; the sidewalls were not sampled	poor	17	16
GC-21	1	Diver noted impenetrable armoring with rock, shell, and debris; no recent sediment deposition	not collected	0	0

Station ID	Collection Attempts[2]	Core Collection Notes	Core Quality[1]	Length Processed (cm)	Bottom Sample Depth (cm)
GC-22	1	Diver noted impenetrable armoring with rock and shells below approx. 1 foot of silty sand; no recent sediment deposition	not collected	0	0

Notes:

1. Core quality was assessed during processing after settling.
2. Number of times diver descended and surfaced. For cores unable to be collected, diver tried several times to acquire a core before surfacing.

SUMMARY OF SAMPLING APPROACH

A recommended tiered sampling approach is presented in Figure 1 based on field observations, presence of thick layers of undisturbed recent sediment deposition, and spatial location of collected cores. This sampling scheme prioritizes samples to be analyzed based on a three-tiered approach. Field samples were triggered for analysis as follows:

Tier #1 Samples (analyzed immediately):

- Cores include: GC-05, GC-09, GC-11, GC-12, GC-13, GC-14, GC-15, GC-16, GC-18, GC-19(A), and GC-20
- Sample intervals: triggered every 6 cm to a depth of 90 cm below mudline (or to refusal)
- Tier #1 Rationale:

    1. Core located outside of areas where propwash would be a significant factor in mixing
    2. Core located in an area where a high percent of fines is observed (potential deposition area)
    3. Core located within the sill area because no data are currently available in this location

Tier #2 Samples (analyzed second depending on Tier #1 results, prioritized vertically):

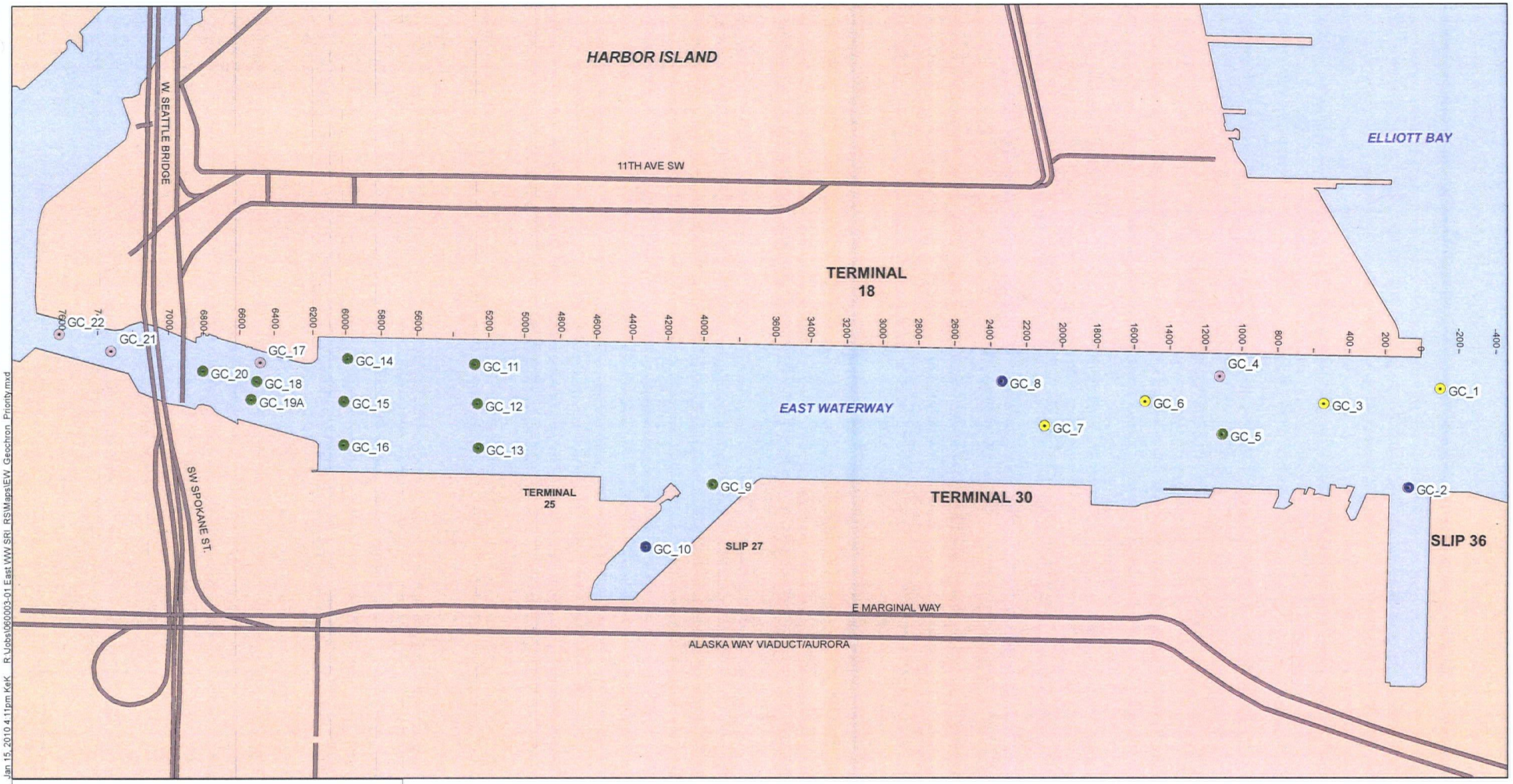
- Cores include: GC-02, GC-08, and GC-10
- Sample intervals: triggered every 6 cm to a depth of 48 cm below mudline (or to refusal); depending on results, these could be triggered from 48 to 90 cm below mudline (or to refusal)

- Tier #2 Rationale:
    1. Core located in slip area where propwash is anticipated to be less of a disturbance
    2. Core located in an area where a high percent of fines is observed (potential deposition area)

Tier #3 Samples (analyzed last if needed, prioritized vertically):

- Cores include: GC-01, GC-03, GC-06, and GC-07
- Sample intervals: triggered every 6 cm to a depth of 48 cm below mudline (or to refusal); depending on results, these could be triggered from 48 to 90 cm below mudline (or to refusal)
- Tier #3 Rationale:
    1. Core located in areas where propwash is expected to be a significant factor in subsurface mixing
    2. Core located in an area where a low percent of fines is observed

Analytical results from the geochronology testing laboratory will be received over the next several months. The East Waterway Group will summarize and provide the analytical results to EPA as data become available. Conference calls will be scheduled to discuss the analytical results, and to discuss the merits of conducting additional analysis of archived samples. Please contact us if you have any questions regarding this information.



GEOCHRON CORES BY PRIORITY

Priority

- TIER 1
- TIER 2
- TIER 3
- Geochron Cores - Not Collected

0 1,000

Scale in feet

Note: Previously established station locations for the East Waterway are shown along the western shoreline for reference

Figure 1
Final Geochronological Core Locations and Prioritization Scheme (Radiochemistry Testing)
East Waterway Operable Unit